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Jeffery J. Brosemer, Ph.D., ESQ. 138 S. Telegraph Hill Road Holmdel, NJ 07733			EXAMINER CONNELLY CUSHWA, MICHELLE R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/677,978

Applicant(s)

WILSON ET AL.

Examiner

Michelle R. Connelly-Cushwa

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 19-23 and 26 is/are rejected.
- 7) ☒ Claim(s) 15-18, 24, 25, 27 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

## **DETAILED ACTION**

### ***Drawings***

Eighteen (18) sheets of formal drawings were filed on October 2, 2003 and have been accepted by the Examiner.

### ***Specification***

The abstract of the disclosure is objected to because it contains more than 150 words. Correction is required. See MPEP § 608.01(b).

The disclosure is objected to because of the following informalities:

On page 4, line 25, "FIG. 2" should be changed to --FIG. 2a to 2c--;

On page 5, line 5, "FIG. 5a to 5f" should be changed to --FIG. 5a to 5e--;

and

On page 5, line 21, "FIG. 11" should be changed to --FIG. 11a to 11c--.

Appropriate correction is required.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

**Claims 7, 17 and 28 are objected to because of the following informalities:**

Regarding claim 7; in line 4 of claim 7, "." should be changed to -- . --.

Regarding claim 17; in line 3 of claim 17, "." should be changed to -- . --.

Regarding claim 28; the claim contains the limitation "(equivalently, the spectral bandwidth of the signal)" in lines 2-3 of the claim. This limitation is unclear because it is impossible to determine whether or not limitations contained in parentheses are

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required. Examiner suggests replacing this limitation with --, which equivalently changes the spectral bandwidth of the signal, --

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1, 2, 4-14, 19, 20-23, 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Moon et al. (US 2004/0246477 A1).**

Regarding claims 1, 2, 4-7, 9, 12, 13 and 19; Moon et al. discloses an optical apparatus (see Figures 1-3), the apparatus comprising:

- at least three ports (14, 28 and 28a; see Figure 3 and paragraph [0076]-[0077]), wherein the ports include at least one input port (14) and at least one output port (28 and 28a);
- a spectral demultiplexer (diffraction grating, 20) to spatially separate one or more multi-wavelength input signals received at an input port as a function of wavelength;

- a single invariant optical spatial filter (mirror, 22) positioned at the demultiplexed image plane to selectively direct each laterally shifted, spatially separated wavelength input signal to an output port as a function of wavelength;
- a means (diffraction grating, 20, and pivoting mechanism, 34) for laterally shifting the spatially separated multi-wavelength input signals relative to the invariant optical spatial filter at the demultiplexed image plane; and
- a spectral multiplexer (diffraction grating, 20) to spatially combine the dispersed multiwavelength output signals and direct the signals into a desired output port;
- wherein all of the input port(s) may be operated as output port(s) and all of the output port(s) may be operated as input port(s);
- wherein a one-to-one correspondence exists between each input port and the incident angle of signals from that port at the spatial filter, relative to its surface normal, and between each output port and the angle of signals deflected to that port from the spatial filter, relative to its surface normal;
- wherein beams of light traversing from one or more input ports to the fixed optical spatial filter and from the fixed optical spatial fiber to one or more output ports intersect an optical pupil (18) in non-overlapping spots;

- wherein the apparatus is an anamorphic optical imaging system;
- wherein the means (diffraction grating, 20, and pivoting mechanism, 34) for laterally shifting the spatially separate multi-wavelength input signals relative to the invariant optical spatial filter at the demultiplexed image plane is a beam steerer directing the optical signals, the beam steerer including a tiltable reflective diffraction grating (20);
- wherein the beam steerer includes a lens (18) for converting angular shift into lateral shift (lens, 18, laterally shifts the focal point for the individual wavelengths as a function of the angular shift of the beam steerer);
- wherein the multiplexer includes the beam steerer lens (18);
- wherein the spectral demultiplexer and the spectral multiplexer includes a diffraction grating (20); and
- wherein the grating is a selectively tiltable MEMS grating.

Regarding claims 8, 10 and 20; the beam steerer may alternately include a tiltable mirror (22, see Figure 5), wherein the mirror is a selectively tiltable, opto-mechanical MEMS tilt mirror, and wherein the means for laterally shifting the spatially separated multi-wavelength input signals relative to the invariant optical spatial filter at the demultiplexed image plane is a lateral translator positioning the invariant optical spatial filter (points on the mirror are laterally shifted as the mirror is rotated).

Regarding claim 14; the apparatus includes a position sensor (42) for detecting the position of the beam steerer.

Regarding claims 21 and 22; the apparatus further comprises a means that includes a detector (position sensor, 42) for determining the position of the spectrum on the spatial filter.

Regarding claim 23; the spatial filter includes a director (the mirror surface) that directs a portion of the light striking the filter.

Regarding claim 26; Moon et al. discloses an optical switch having a plurality of ports (see Figures 1-3) and a method of switching a received multi-wavelength signal from one of the ports to another of the ports, the method comprising the steps of:

- spatially separating the multi-wavelength signal as a function of wavelength (see paragraphs [0059]-[0061]);
- laterally shifting the spatially separated multi-wavelength signal at the demultiplexed image plane relative to an invariant spatial filter (see paragraphs [0065]-[0076]);
- selectively directing, each shifted spatially separate wavelength input signal to a desired port as a function of wavelength (see Figure 3); and
- spatially combining the dispersed multiwavelength output signals, such that desired multiwavelength signals are switched from one of the ports to another of the ports.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al. (US 2004/0246477 A1).**

Regarding claim 3; Moon et al. does not specifically state that the apparatus comprises at least two input ports, however, Moon et al. does suggest that multiple launch pigtails (see the first two lines of paragraph [0077]) may be present. Therefore, one of ordinary skill in the art would have found it obvious to incorporate at least two launch pigtails (input ports) in the invention of Moon et al., as specifically suggested by Moon et al.

***Allowable Subject Matter***

Claims 15-18, 24, 25, 27 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 15-18, 24, 25, 27 and 28 distinguishes over the prior art of record for the following reasons.

Regarding claims 15 and 16; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical apparatus as defined in claim 15, wherein the spatial filter includes a reflective field surrounding other reflective surfaces whose surface normals are tilted

relative to the surface normal of the reflective field in combination with the other limitations of the base and intervening claims. Claim 16 depends from claim 15.

Regarding claim 17; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical apparatus as defined in claim 17, wherein the fixed spatial filter includes one or more diffraction gratings of different spatial frequency positioned within a diffractive field grating of a different spatial frequency in combination with the other limitations of the base and intervening claims.

Regarding claim 18; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical apparatus as defined in claim 18, further comprising a reconfigurator that varies the spatial position of the spectrally dispersed input signals relative to the spatial filter, such that switched signals transition from a grating at one spatial frequency to a grating at a different spatial frequency while non-switched signals remain on a continuous grating of substantially fixed spatial frequency and thus are not interrupted during the reconfiguration in combination with the other limitations of the base and intervening claims.

Regarding claims 24 and 25; the claims are allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical apparatus as defined in claim 24, wherein the director includes an aperture in combination with the other limitations of the base and intervening claims. Claim 25 depends from claim 24.

Regarding claim 27; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious a method as defined in claim 27, comprising reconfiguring the position of the signals relative to an invariant spatial filter while directing all of the signals into a first output port; and switching a selectable portion of the signals into a second output port while directing the remainder of the signals into the first output port in combination with the other limitations of claim 27 and the limitations of the base claim.

Regarding claim 28; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious a method as defined in claim 28, comprising changing the number of signals, which equivalently changes the spectral bandwidth of the signal, directed into one or more output ports while not interrupting those signals initially directed into the output ports that are not being switched from one output port to another in combination with the limitations of the base claim.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 15-18, 24, 25, 27 and 28.

### ***Conclusion***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

  
Michelle R. Connelly-Cushwa  
Patent Examiner  
May 9, 2005